Exploitation or Empowerment? The Impact of Textile and Apparel Manufacturing on the Education of Women in Developing Countries.

Ozsoz, Emre

Fashion Institute of Technology - SUNY

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Emre Ozsoz, PhD

Fashion Institute of Technology, State University of New York

School of Liberal Arts

27th Street at 7th Ave, New York, NY 10001

Tel: +1-212-217-4929; Fax: +1-212-217-4641

Emre_ozsoz@fitnyc.edu

One of the most cited criticism for US fashion brands is their exploitation of workers in their overseas manufacturing facilities. This paper studies whether such textile and apparel production facilities (also known as "sweatshops") lead to lower education and thus a lower socio-economic status for women working in them. Results suggest it is not as a clear-cut conclusion. Evidence suggests a higher ratio of women receive primary education as apparel and textile exports increase while at the secondary level of education however, the results suggest the opposite. We also evaluate to see if women marry at a later age as a result of working in these factories, yet fail to find any conclusive evidence.

1. INTRODUCTION

In the US and in other industrialized countries it is common to find activists that are critical of working conditions in textile and apparel factories in the developing world. Two of the commonly cited criticisms of these jobs are that they lead to an increase in school dropout rates and that they prevent school-age girls from receiving proper education. Recent horrible events such as the 2013 collapse of Rana Plaza, a garment-factory in Savar, Bangladesh resulting in the death of 1129 workers have also increased awareness of the working conditions in such factories.

This paper approaches the "sweatshops" debate from a relatively less explored perspective, the impact of these jobs on the schooling of women who make up most of the labor force in these factories and thus their socio-economic status in these countries. We investigate the following question: whether in reality school-age girls or young women who work in apparel and textile industries have lower educational attainment compared to their counterparts who work in other industries. The evidence is mixed on this topic. Although the common belief is that working in these facilities prevent school-age girls from attending school, there have been reports that suggest otherwise. For instance, in a World Bank policy research report in 2000 Paul-Majumder and Begum illustrated that female workers employed in export zones in Bangladesh had more years of schooling compared to their counterparts who worked in other areas (See Figure 1.) Data compiled for this paper from a larger pool of 46 apparel and textile exporting countries spanning over 33 years (1980-2012), shows that this phenomenon is not necessarily confined to Bangladesh. The average years of schooling for females in these 46 countries is highly correlated with the ratio of their combined apparel and textile exports to their GDP. (See Figure 2 and Table 1) Although we observe countries with high ratios of textile and apparel exports in their GDP with low years of schooling and secondary school enrollment rate such as Cambodia, Lesotho

and Honduras, we can find many other developing countries with relatively lower export ratios and better education levels (i.e. Bulgaria, Jamaica, Jordan or Sri Lanka). These findings give us further motivation to research this topic to see if all these observations are merely spurious correlations or whether there is a statistically significant link between the two variables.

This paper is organized as follows: in the next section we provide a summary of literature on the topic; Section 3 describes our data and the methodology to be used in exploring our research question. We present our findings and conclude in Section 4.

2. RELATED LITERATURE

Establishing a theoretical framework between education and apparel and textile exports of a developing country is not easy due to lack of research on the topic. Most existing literature including this paper approaches such a relationship from an empirical perspective. However this does not mean there is no research that we can use as guidance in framing a theoretical basis for our analysis. Below we provide a brief survey of related literature on this topic.

Some of the earliest economic models on schooling are built on the relationship between schooling and economic growth. Among these works are Becker (1964), Ben-Porath (1967), Mincer(1974) and Rosen (1976). These early papers highlight the strong correlation between economic growth and schooling. One of the most note-worthy works on this relationship is by Bils and Klenow dating as recently as 2000. In their seminal paper published in the American Economic Review, the two economists study the strength and the direction of the causality between schooling and economic growth. Their finding is ground-breaking since it shows that the causality is too weak to explain more than one-third of economic growth suggesting that two-

thirds of economic growth is related to factors other than education. The two economists also find that the causality can run both ways, in other words from growth to education. [1]

The theoretical linkage between textile and apparel manufacturing and economic growth is one that can be best explained via the growth theory. A country that specializes in R&D-intensive activities will develop a dynamic comparative advantage which will enhance economic growth (Grossman and Helpman, 1991) Additionally, international trade fosters innovation and creativity by reducing the duplication effect in R&D activities as argued by Rivera-Batiz and Romer (1991). Although textile and apparel manufacturing are labor intensive and rank at the bottom of the industrialization ladder, they do have an important role to play in the economic growth story of a country. Textile industry is one of the "starter" industries especially for countries that follow an export-oriented growth path such as China (Gereffi, 2002.) There are a couple of reasons why the industry plays a crucial role in economic growth:

- the sector employs a large number of unskilled labor usually from agricultural sector;
- the set-up costs are relatively low;
- the expansion of the sector enables other sectors to take hold such as dye and chemicals (Brenton et al. 2007.)

We can argue that through their impact on economic growth the textile and apparel manufacturing industries indirectly influence schooling and the educational attainment in a developing country. As textile and apparel manufacturing countries use the knowledge base they acquired through set up and expansion of these industries, they expand into other sectors such as chemicals. As a result, a new class of income earners forms. This new middle class can afford to provide more years of schooling to their children; alternative career paths emerge for future

generations as opposed to traditional areas of work such as agriculture and low-skill intensive sectors. Along with economic growth we observe a lower incidence of child labor, better working conditions and improved purchasing power.

However, the industry can have a direct impact on social aspects. Studies have shown that the wages women are able to earn in the garment industry are higher than those in the available alternative forms of employment (Kabeer and Mahmud, 2004.) Textile and apparel manufacturing workers in Cambodia; Madagascar; Pakistan; India; El Salvador; Guatemala; Dominican Republic; China and Mexico are paid higher than those in the agricultural sector workers (Keane and te Velde, 2008.) In a related study Mollick and Ibarra-Salazar (2013) demonstrate that higher productivity in Mexican Maquiladora industry result in higher wage premiums between skilled and unskilled labor in Mexico. Higher wages enable more economic freedom. Considering that in most of these countries female workers make up a good portion of total employment in textile and apparel manufacturing, we can assume economic benefits mostly accrue to women in these countries. Yet studies that focus on this direct linkage are rare. Keane and Willem te Velde (2008) provide a detailed descriptive analysis on how textile and apparel manufacturing industries provide higher incomes and jobs for women, while Grueben and McLeod (2006) are the only ones that have recently worked on exploring this relationship. We hope that this paper fills in an important vacuum in this area.

3. DATA AND METHODOLOGY

To explore the impact of employment in textile and apparel manufacturing industries on educational and social outcomes for women, we compiled data on a number of educational and demographic indicators. For proxies on educational outcomes we use the average years of

primary schooling for females between the ages of 15-19 as well as net secondary education enrolment rate for females in countries where textile and apparel exports make up for more than 1% of all economic activity measured by gross domestic product (GDP).[2] To evaluate the impact on social standing of women we use data on the ratio of females married or in a union for the 15 to 19 age group. Schooling and GDP data is obtained from World Bank Databases while data on textile and apparel exports is obtained from WTO databases. We checked for unit roots in our data and found none.[3]

Following previous work on determinants of schooling (i.e. Bils and Klenow (2000)) and on educational attainment of textile workers (i.e. Gruben and McLeod (2006)) we utilize an empirical model that studies the impact of textile and apparel export industry production on the years of schooling and net secondary education enrollment rates for females in over 40 countries. (the number of countries used in each regression analysis changes due to availability of data for each variable). Table 2 provides descriptive statistics for our data. The mean net enrollment rates of females in all secondary education programs among the 40 countries is almost 60% with a standard deviation of 21%. This indicates that the variation among secondary education enrollment in our sample is large. The mean number of years of schooling for females aged 15 to 19 is around five years ranging between 8 years (Bulgaria) and only 6 months (Nepal). The mean ratio of Textile and Apparel exports to GDP is 7% but ranges from 1% (Our cut-off limit) to as high as 41% in the case of Lesotho. The growth rate of the GDP in our sample is on average 4.25% ranging from -9% (Zimbabwe in 2002) to 13% (Belize in 2000).

We use the following empirical specifications to measure the impact of textile and apparel sector employment on educational outcomes:

$$esy_{i,t} = \beta_o + \beta_1 g_{i,t} + \beta_2 ta_{i,t} + \varepsilon \quad (1)$$

$$sse_{i,t} = \beta_o + \beta_1 g_{i,t} + \beta_2 ta_{i,t} + \varepsilon \quad (2)$$

where $esy_{i,t}$ represents average years of primary schooling for females between the ages of 15 and 19 and alternatively $sse_{i,t}$ refers to the net enrollment rates of females in all secondary education programs in country *i* at time *t*. β_o is the country specific intercept; $g_{i,t}$ stands for growth rate of GDP as a percentage for country *i* at time *t* and $ta_{i,t}$ is the relative share of textile and apparel exports for country *i* at time *t* to its GDP in our estimation.

In an effort to concentrate only on countries where apparel and textile manufacturing are a significant portion of export industries, we exclude countries where the annual share of apparel and textile exports to GDP is less than 1% in our estimations.[4] We also break up our group into two subsets based on how reliant the country's economy is on the textile and apparel manufacturing industry. We estimate Equation (1) separately for countries that have textile and apparel export ratios between 1 and 5 percent and then for countries that have the same ratio above 5%.

Another aim of this research is to estimate the impact of textile and apparel sector employment on the outcome of marriage ratios for the females. Our hypothesis is working in these facilities can have a delaying effect on the marriage ages of females who are employed in these factories. For this reason we rewrite models (1) and (2) as follows:

$$m_{i,t} = \beta_o + \beta_1 g_{i,t} + \beta_2 ta_{i,t} + \beta_3 tr_{i,t} + \varepsilon \quad (3)$$

where $m_{i,t}$ represents the ratio of females aged 15 to 19 that are either married or in a union in country i at time t; $g_{i,t}$ stands for growth rate of GDP as a percentage for country i at

time t and $ta_{i,t}$ is the relative share of textile and apparel exports for country i at time t to its GDP. To account for differences resulting as a result of religious differences for the 21 countries for which we have data on marriage statistics, we employ a dummy variable $tr_{i,t}$ which takes on the value of 1 if the country is a traditional society where marriages at an early age are common practice for women and zero otherwise.[5]

The sign and the magnitude of β_2 coefficient in all three estimations are of great importance in this study. We expect the sign of this coefficient to be negative if employment in textile and apparel industries causes young women to drop out of school at an earlier age and a positive sign if otherwise. Results of our estimations are discussed in the next section.

4. FINDINGS

The results of our estimations for Models (1) through (3) can be seen in Table 3. For estimations using specification (1) and (2) we broke up our analysis into two subgroups (denoted by "a" and "b") based on the ratio of textile and apparel manufacturing to the overall GDP. In doing so we aim to see whether there are differences between countries and periods based on reliance of the economy on the two sectors. Estimations for 1.(a) include countries that have a ratio between one and five percent for the share of their textile and apparel exports to their GDP while estimations for 1.(b) include those countries where this ratio is over 5%.

We observe that the growth rate of gdp (g) enters our estimations with a positive sign for specifications (1) and (2). This suggests that as the economy grows, the average number of years of elementary schooling and the net enrollment rate of females aged 15 to 19 increases. This is an expected result given findings of previous literature on the subject. A one-percentage increase

in the growth rate increases the average years of elementary schooling by 3% or in other words by 10 days. The coefficient of this variable is 0.22 for specification (2) which also suggests that a 3% increase in the country's growth rate in a particular year translates into an increase of 1% in the secondary school enrollment rate of females aged 15 to 19. For countries that are heavily reliant on textile and apparel manufacturing however the variable is not significant suggesting that the relationship may not be that clear.

The coefficient of the ratio of textile and apparel exports to GDP ratio enters our estimations for specification (1) significantly and with a positive sign. This suggests that for every one percent increase in the ratio of textile and apparel exports to a country's GDP, the average years of schooling increases by 4% of a year or in other words by 15 days. For countries that are not heavily reliant on textile and apparel manufacturing (Specification (1).a - where the *ta* ratio is between one and five percent) this effect is almost three times stronger; yet insignificant for countries that are major producers of textiles and apparel (specification (1).b.) We believe the reasons behind such a result are obvious. Although textile and apparel jobs are some of the least skill requiring among other manufacturing positions, there is still a need for a minimum level of mechanical aptitude. For instance, to be able to operate a sewing machine, a worker needs to have at least a minimum skill set or some experience. Additionally employers may prefer employees who can at least read and write which are acquired during elementary education. For these reasons we think this finding makes sense and is meaningful.

An unexpected and interesting result of our estimations is the coefficient of the *ta* (the ratio of textile and apparel exports to overall GDP) variable for specification (2).a. The negative and significant coefficient of this variable (-36.97) suggests that for countries that are not heavily reliant on textile and apparel manufacturing, an increase of 1% in the ratio of textile and apparel

exports to GDP results in a 4% drop of net enrollment ratio of females in secondary education. This finding supports the view that textile and apparel jobs hinder women's education beyond elementary school.

Our estimations for model (3) where we look at the percentage of 15 to 19 year old females that are married or are in a union find no significant relationship between textile and apparel production and this variable. This might be due to the small number of observations available for this analysis (only 21 observations); we also observe a relatively high probability value for the F statistics. Although a scatter plot of the marriage variable versus the ratio of textile and apparel production to GDP suggests a negative relationship as illustrated in Figure 3, the regression analysis does not provide us with a conclusive answer.

In conclusion, our analysis provides mixed results for the question at hand. Although we can say with some degree of confidence that growth rate of the country's economy improves education levels of females aged 15-19 as the growth theory leads us to believe, we cannot make the same argument with respect to the impact of textile and apparel manufacturing on the education levels of women or on the marriage outcomes. Although we have some evidence that suggests textile and apparel manufacturing improves education at the primary level; at the secondary level the results suggest the opposite. In that regard, we believe the field will benefit from further research on the topic.

5. CONCLUSION

According to ILO as of 2013 over sixty million workers most of whom are women are employed in Textile Clothing and Footwear industries worldwide. The main market destination

of production in these facilities is North America and Europe. The working conditions at these factories come to media spotlight from time to time sometimes as a result of catastrophic event such as the Rana building collapse in 2013. Yet our understanding and knowledge of these factories and these jobs is limited mostly to the working conditions. The reasons why workers choose to seek employment in these facilities or the impact of these jobs on their social and economic standing is seldom explored in the literature or in the media. This paper approaches this issue from this perspective. It aims to provide a new perspective to the question at hand and tries to see if there is any positive impact on the lives of women who make up most of the working force in these factories. By using data for 40 countries we show that overall there is a positive impact on the schooling outcomes of women who are employed in these factories. Yet this outcome is mostly limited to primary education. In secondary school enrollment we fail to see any positive impact. In fact our analysis shows that increases in the country's textile and apparel manufacturing ratio to its GDP hurt lower the percentage of females receiving secondary education. We also tackle the question of delayed marriage as a result of employment in these factories but fail to find any conclusive evidence on this topic mainly due to lack of data. However, we believe our study is a move in the right direction and will draw further academic attention to the status of women in these factories and their stories.

6. FIGURES

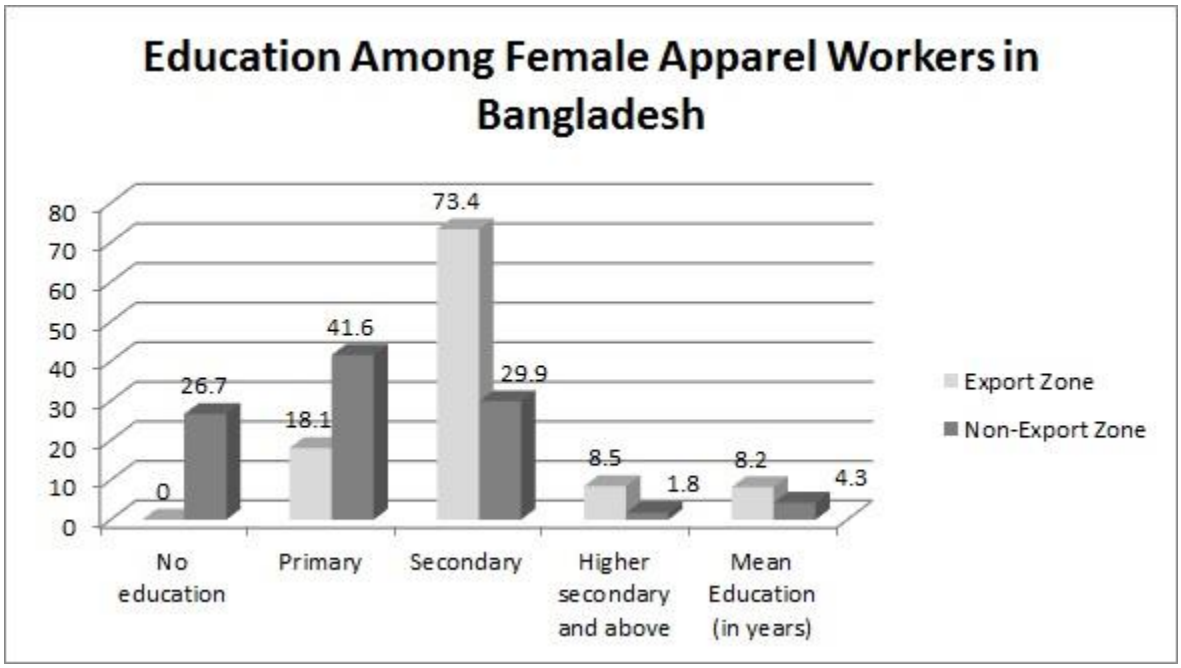

Figure 1. Education Among Females Workers in Bangladesh (Export Zone vs Non-Export Zone)

This figure shows the distribution of female apparel workers in Bangladesh (as a percentage of total female workers employed) in export zones and in other areas as well as the average number of years of education for both groups. Source: "The Gender Imbalances in the Export Oriented Garment Industry in Bangladesh," by Pratima Paul-Majumder and Anwara Begum, World Bank Policy Research Report on Gender and Development, Working Paper Series no. 12, June 2000.

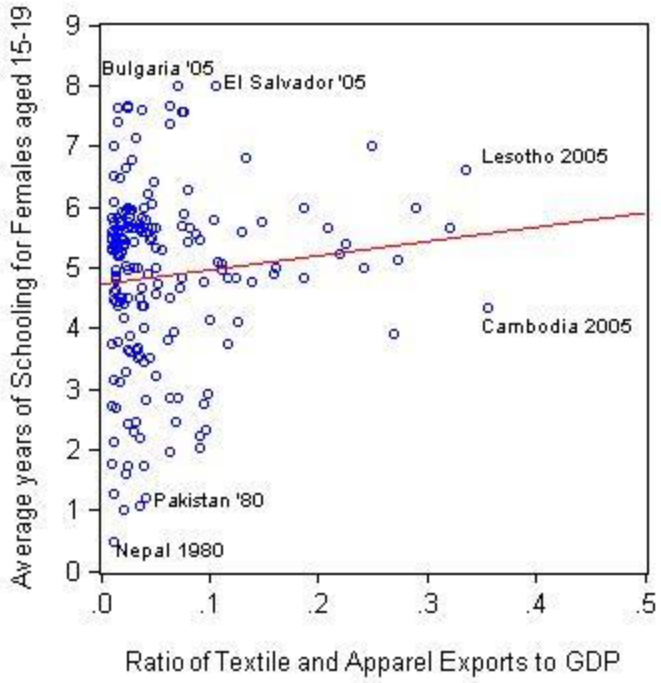

Figure 2. Average years of schooling vs. Ratio of Textile and Apparel Exports to GDP

This figure shows the correlation between the ratio of textile and apparel exports to GDP for 46 countries for an unbalanced sample of 33 years (1980-2012) where such ratio is over 1% of all GDP versus the average years of primary schooling for females aged 15-19. Source: World Bank

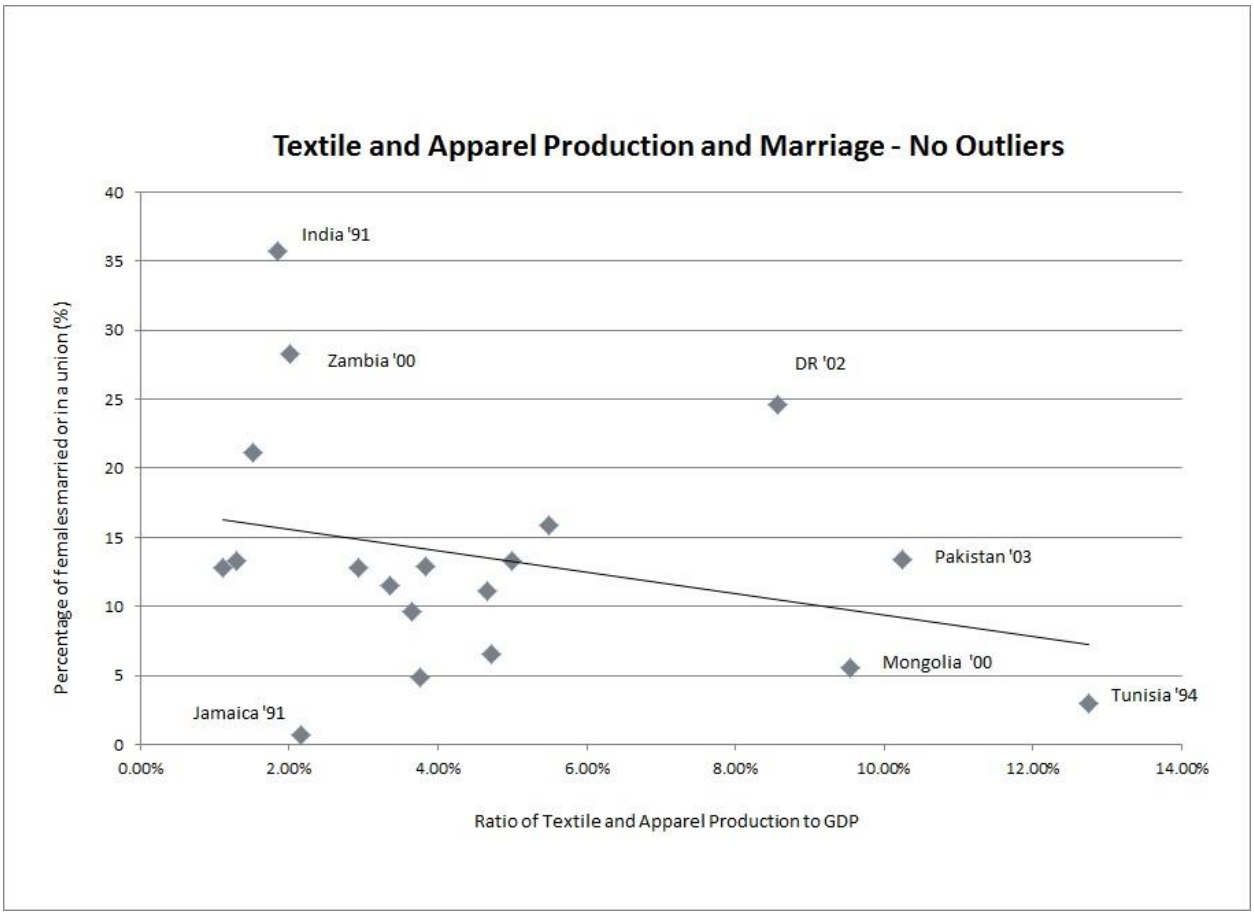

Figure 3. Textile and Apparel Production vs. Marriage among Females

This figure shows the correlation between the ratio of textile and apparel exports to GDP for a group of 21 countries between 1991 and 2003 plotted against the ratio of females aged 15 to 19 that are either married or in a union. The trendline shows the predicted values based on a linear relationship with the equation $y = -0.5644x + 18.231$ where y represents marriage ratio among females and x represents the ratio of textile and apparel production to country's GDP. Source: WTO and UN Development Statistics

7. TABLES

Country	Mean Textile + Apparel Exports to GDP Ratio	Mean of Average yrs of schooling	Mean secondary school net enrollment for females (% of all school age females)
Bangladesh	8.15%	2.68	40.49%
Belize	4.06%	7.36	68.19%
Bhutan	2.18%	NA	38.45%
Botswana	1.95%	5.78	35.60%
Brunei	2.20%	4.86	70.82%
Bulgaria	5.40%	6.81	84.86%
Cambodia	31.20%	3.45	20.48%
China	4.16%	5.09	NA
Colombia	1.34%	4.24	72.69%
Costa	2.05%	5.39	39.28%
Croatia	2.55%	5.06	89.68%
Dominican Republic	6.24%	4.62	58.11%
Egypt	1.39%	3.37	26.36%
El Salvador	7.33%	5.51	52.82%
Fiji	4.34%	6.54	82.95%
Gambia	1.84%	1.74	7.29%
Ghana	1.15%	3.65	36.91%
Guatemala	4.63%	3.14	28.78%
Guyana	2.07%	5.27	79.04%
Honduras	17.27%	4.73	25.74%
India	1.84%	2.84	NA
Indonesia	2.83%	4.65	42.66%
Jamaica	2.88%	5.40	72.16%
Jordan	4.00%	5.06	85.84%
Kenya	1.21%	5.10	39.80%
Lesotho	28.98%	5.44	22.51%
Malawi	1.52%	3.46	25.44%
Malaysia	2.83%	5.32	61.05%
Mauritius	16.71%	5.03	63.19%
Mexico	1.40%	4.94	63.10%
Mongolia	5.48%	3.09	76.01%
Morocco	3.85%	2.16	30.24%
Nepal	3.91%	1.76	52.81%
Pakistan	7.72%	2.06	27.57%
Panama	8.58%	5.49	65.69%
Peru	1.30%	5.04	64.47%
Philippines	2.90%	5.45	61.30%
Sri Lanka	9.83%	5.83	78.40%
Thailand	3.50%	5.26	64.72%
Togo	1.14%	3.16	12.09%
Tunisia	9.12%	4.04	19.77%
Turkey	3.74%	3.67	63.39%
Uruguay	2.02%	5.64	73.44%
Vietnam	9.03%	4.33	NA
Zambia	2.01%	4.94	NA
Zimbabwe	1.60%	4.97	37.22%

Table 1. Mean Values for Textile and Apparel Export Data and Education

This table shows the mean values for the three variables used in our estimations: Ratio of textile and apparel exports to overall GDP; the mean of average years of schooling for females aged 15-19, and mean of net enrollment rate for females in secondary education. Source: World Bank, WTO.

Parameter	Net enrollment rates of females in all secondary education programs as a percentage (sse)	Average years of primary schooling for females between the ages of 15 and 19 (esy)	Ratio of Textile and Apparel Exports in GDP (ta)	Growth rate of gdp as a percentage (g)	Percent ever married or in union among females aged 15-19 (m)
Mean	59.40	4.87	0.07	4.25	15.15
Median	64.02	5.21	0.04	4.76	12.80
Maximum	96.85	8.00	0.41	13.04	51.30
Minimum	6.15	0.47	0.01	-8.89	0.70
Std. Dev.	20.97	1.52	0.08	3.48	11.76
Skewness	-0.32	-0.57	2.40	-0.89	1.62
Kurtosis	2.11	3.20	8.50	4.55	5.53
Jarque-Bera	13.18	10.06	582.09	60.98	14.73
Observations	262	181	262	262	21

Table 2. Descriptive Statistics

The table shows the descriptive statistics for the variables used in our estimations. Source: World Bank, WTO and UN Development Statistics

Dependent Variable:	Average years of primary schooling for females between the ages of 15 and 19 (esy) - All sample	Average years of primary schooling for females between the ages of 15 and 19 (esy) - Ctries/Periods for which ta ratio is 1% to 5%	Average years of primary schooling for females between the ages of 15 and 19 (esy) - Ctries/Periods for which ta ratio is over 5%	Net enrollment rates of females in all secondary education programs (sse) - All Sample	Net enrollment rates of females in all secondary education programs (sse) - Ctries/Periods for which ta ratio is 1% to 5%	Net enrollment rates of females in all secondary education programs (sse) - Ctries/Periods for which ta ratio is over 5%	Percent ever married or in union among females aged 15-19 (m)
SPECIFICATION	(1)	(1).a	(1).b	(2)	(2).a	(2).b	(3)
Constant	4.46***	4.31***	4.84***	57.07***	70.64***	49.33***	18.54***
	0.14	*0.24*	*0.32*	*1.26*	*2.11*	*2.74*	*4.89*
Growth rate of gdp (g)	0.03*	0.03*	0.02	0.29**	0.22*	0.36	-0.67
	0.02	*0.02*	*0.03*	*0.15*	*0.14*	*0.29*	*0.71*
Ratio of Textile and Apparel Exports in GDP(ta)	4.34**	13.63*	0.31	15.60	-36.97***	22.35	-41.75
	1.90	*9.01*	*2.46*	*14.93*	*8.56*	*16.00*	*55.40*
Traditional Society Dummy (tr)							4.26
							5.35
Number of observations	181	120	61	262	154	108	21
No of ctries	43	38	22	38	30	16	21
Adj. R Square	0.72	0.71	0.81	0.89	0.91	0.91	0.12
F Statistics (Probability)	11.33 (0.00)	8.61 (0.00)	12.20 (0.00)	55.85 (0.00)	51.73634	68.60 (0.00)	0.81 (0.00)
Method	Panel Least Squares	Panel Least Squares	Panel Least Squares	Panel Least Squares	Panel Least Squares	Panel Least Squares	Least Squares
* significant at 10%, ** significant at 5%, ***significant at 1%							

Table 3. Estimation Results

The table shows the results of our estimations for the three models. Standard errors of coefficients are in *italics* below the coefficients.

REFERENCES

Becker, Gary S., 1964. *Human capital*. Chicago: University of Chicago Press.

Ben-Porath, Y. (1967). The production function of human capital and the life cycle of earnings. *Journal of Political Economy,* 75, 352-365.

Bils, M., & Klenow, P. (2000). Does schooling cause growth? *American Economic Review* 90, 1160-1183.

Brenton, P., & Hoppe, M. (2007). Clothing and export diversification: still a route to growth for low income countries? World Bank Policy Research Working Paper 4343

Córdoba, Juan Carlos & Ripoll, Marla, 2013. "What explains schooling differences across countries?," *Journal of Monetary Economics*, Elsevier, vol. 60(2), pages 184-202.

Gereffi, G., 2002. "Outsourcing and Changing Patterns of International Competition in the Apparel Commodity Chain", Conference on Responding to Globalization: Societies, Groups, and Individuals, Hotel Boulderado, Boulder, Colorado, April 4-7.

Grossman, G., Helpman, E., 1991. *Innovation and Growth in the Global Economy*, MIT press.

Grueben, W. C and D. McLeod, 2006. "Apparel Exports and Education: How Developing Nations Encourage Women's Schooling." Economic Letter, Federal Reserve Bank of Dallas. [1]:3. March.

Jacoby, Hanan G, 1994. "Borrowing Constraints and Progress through School: Evidence from Peru," *The Review of Economics and Statistics*, MIT Press, vol. 76(1), pages 151-60, February.

Kabeer, N. and S. Mahmud, 2004. "Rags, Riches and Women Workers: Export-oriented Garment Manufacturing in Bangladesh." Available on the web: http://www.wiego.org/publications/Chains%20of%20Fortune%20Chapters/Kabeer%20and%20Mahmud%20Export%20Oriented%20Garment%20Manu%20in%20Bangladesh.pdf

Keane, J. and D. Willem te Velde, 2008. "The role of textile and clothing industries in growth and development strategies." Working Paper Overseas Development Institute, 7 May.

Mincer, Jacob, 1974. *Schooling, experience, and earnings.* New York: Columbia University Press.

Mollick, André Varella and Jorge Ibarra-Salazar, 2013. Productivity Effects on the Wage Premium of Mexican Maquiladoras. *Economic Development Quarterly*, August 2013 27: 208-220.

Paul-Majumder, P. and Anwara Begum, 2000. "The Gender Imbalances in the Export Oriented Garment Industry in Bangladesh," *World Bank Policy Research Report on Gender and Development*, Working Paper Series no. 12, June 2000.

Rivera-Batiz, L., Romer, P. (1991), "International Trade with Endogenous Technological Change", *European Economic Review*, Vol. 35, No 4, pp.971-1001.

Rosen, Sherwin, 1976. "A Theory of Lifetime Earnings." *Journal of Political Economy*, August, 84{4), pp. S45-S57.

[1] More recent studies on schooling such as Cordoba and Ripoll (2013) include other determinants into the standard Ben-Porath model such as credit constraints which can be borrowing constraints for students or non-negative bequest constraints (simply parental support). Both constraints have been shown to play a significant role in influencing the decision to acquire more education both in the US and in other countries. See Jacoby (1994) for a good illustration of the borrowing constraints effect on school attendance and completion in the case of Peru or DeGregorio (1996) for the case of OECD and other developing countries.

[2] Countries with textile and apparel export ratios below 1% are omitted from results in an effort to concentrate only on countries where these industries provide a significant contribution to overall economic activity.

[3] The Levin,Lin and Chu test statistics for "ta" and "sse" variables are -2.71 (with a p value of 0.003) and -5.10 (with a p value of 0.000) respectively; We cannot compute unit root tests for the "ssy" variable due to the lack of continuous observations.

[4] This means if a country has a cumulative textile and apparel production level that is less than 1% of its GDP in a given year, the data for that country in that year is excluded from estimations. In the event that the country's textile and apparel production exceeds 1% in the following year, the country is then added to the dataset.

[5] In our dataset the following countries take on the value of 1 for this variable: Bangladesh, Brunei, India, Indonesia, Malaysia, Morocco, Pakistan, Tunisia and Turkey.